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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,000	02/18/2004	Moris Dovek	HT03-005	2422

7590   09/17/2008

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ART UNIT	PAPER NUMBER
2627	

MAIL DATE	DELIVERY MODE
09/17/2008	PAPER

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 10/781,000
Filing Date: February 18, 2004
Appellant(s): DOVEK ET AL.

Stephen B. Ackerman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 30, 2008 appealing from the Office

action mailed November 27, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

WO 98/20485 A1	CARPENTER et al.	05-1998
JP 06-342858 A	MURATA et al.	12-1994

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-6, 19 and 21-24 rejected under 35 U.S.C. 103(a) as being unpatentable over Carpenter et al. (WO 98/20485 A1) in view of Murata et al. (JP 06-342858 A).

As per claims 1 and 19, Carpenter et al. (WO 98/20485 A1) discloses a crosstalk and EME (electromagnetic emission) minimizing trace suspension assembly structure (16) and a method thereof, comprising: multiple write lines (e.g., 60, 62) which are crossed between a preamplifier connection point (at 54) and slider write contact pads (22) (e.g., see, *inter alia*, page 7, line 12-23 and page 8, lines 20-29); multiple read lines (e.g., 60, 62 - see in particular page 8, lines 21-25) driven by preamplifier circuits (including 54); the aforementioned slider contact pads (22), which connect said write lines (60, 62) to said trace suspension assembly (16); the aforementioned slider contact pads (22), which connect said read lines (another set of service lines (60, 62) to said trace suspension assembly (16); and multiple write line driven by preamplifier circuits (at 54 via the semiconductor IC chip), wherein said multiple write lines which are crossed between said preamplifier connection point and said slider contact pads are used to cancel out time-delayed (transmission line effects) parts of said crosstalk and said EME.

As per claims 3 and 21, wherein said crossing point of said write line (60, 62) is made by the addition of a second metallization layer (e.g., 60A or 62A) onto said trace suspension assembly (16).

As per claims 4 and 22, wherein multiple crossing points of said write lines are used to further cancel out time-delayed (transmission line effects) parts of said crosstalk and EME (based on the crossover structure of the lines (60, 62)).

As per claims 5 and 23, wherein said write lines (60, 62) have parasitic capacitance between the write lines and the read lines (another set of service lines (60, 62), due to the intrinsic metal-dielectric-metal structure).

As per claims 6 and 24, wherein said parasitic capacitances between the write lines (60, 62) and read lines other set of service lines, 60, 62) are used to cancel crosstalk noise between said write lines and said read lines due to the effective "twisting" structure of the traces.

As per claims 1 and 19, Carpenter et al. (WO 98/20485 A1) does not expressly disclose a single crossing point of said write lines between said preamplifier connection point and said slider contact pads (22) as being placed halfway between said preamplifier connection point and said slider contact pads - e.g., note the phrase "a single crossing point" requires just a crossing at the midpoint, but does not preclude other crosses of the wiring - e.g., see Appellant's claims 4 and 22, which depend from claims 1 and 19, respectively, and which recite "multiple crossing points."

Murata et al. (JP 06-342858 A), however, discloses an integrated circuit chip, wherein the signal lines (1, 2) between the IC chip (7) and the termination pads (3, 4) are crossed halfway between the IC chip and the termination pads (3, 4). Murata et al. (JP 06-342858 A), as readily depicted in FIG. 2, illustrates the advantages to such symmetrical midpoint crossing, (i.e., a crossing at a half point between the lines (1, 2)), stating in paragraph [0010] of the enclosed English translation (provided by the USPTO STIC Library and enclosed herewith):

In the following, an explanation will be given regarding the operation in this application example with reference to Figure 2. As shown in the figure, currents I1, I2 flow in opposite directions on signal transmission lines (1), (2) crossing each other via glass film (8), respectively. On one side (left side in the figure) of the crossing portion between signal transmission lines (1), (2), magnetic field M1a generated by current I1 and magnetic field M1b generated by current I2 are in the direction where they strengthen each other, and synthetic magnetic field M1b is generated in the downward direction. On the other side (right side in this figure) of the crossing portion of signal transmission lines (1), (2), magnetic field M2a generated by current I1 and magnetic field M2b generated by current I2 are generated and they strengthen each other, so that synthetic magnetic field M2 is generated in the upward direction. That is, synthetic magnetic field M1 and synthetic magnetic field M2 are in directions that cancel each other. As a result, for the overall integrated circuit, *the magnetic fields are canceled __equivalently__*, and the magnetic field emitted from the integrated circuit can be suppressed. Consequently, the electromagnetic noise emission characteristics can be improved. [Emphasis added].

Note that the differential current signals (I1 and I2) correspond directly to the differential current signals W- and W+ or R+ and R- of the disclosed Appellant's invention.

Can these magnetic fields (M1 and M2) within Murata et al. (JP 06-342858 A) be canceled equivalently (i.e., equal cancellation) at some arbitrary crossing point between the wires? Certainly not. As is evidenced by Murata et al. (JP 06-342858 A) in each and every instance all the depicted embodiments, the crossing point is indeed halfway and symmetric in order to balance out the opposing magnetic fields generated by each side of the crossing point. More to the point, however, is the known Biot-Savart Law in physics, as it relates magnetic fields to the currents which are their sources. See Fundamentals of Physics (Halliday and Resnick, Copyright 1981 by John Wiley & Sons, Inc.) at pages 557-558, enclosed herewith.

In scalar format, the Biot-Savart Law can be written as:

$$dB = \frac{\mu_0}{4\pi} \frac{Idl \sin \theta}{r^2} \Rightarrow B = \int \frac{\mu_0}{4\pi} \frac{Idl \sin \theta}{r^2}$$

Where I is the current,

dl is a the magnitude in the length of the differential element of the wire,

dB is the differential contribution to the magnetic field resulting from the differential element of wire, and B is the summed magnetic field over the entire length of the wire,

μ_0 is the magnetic constant,

r is the distance from the wire element to the point at which the magnetic field is being calculated.

The point to be made here is that the strength of the magnetic field B associated with a *finite* length of wire l, is directly proportional to the length of wire l. More to the point, for a non-infinite or short length of wire carrying a current which generates a magnetic field, the longer the wire, the stronger the magnetic field B contributed by that length of wire.

Turning now to Figure 2 of Murata et al. (JP 06-342858 A), the wires (1, 2), prior to crossing at (8) (i.e., the left side of the crossing point (8)), generate a composite or synthetic magnetic field downward (M1) due to Fleming's Right-Hand rule (right-hand thumb points in direction of current, fingers wrap-around the wire and represent the conventional magnetic field direction associated with such a directional current). Thus, the contribution of the current I1 and I2 in the wires (1,2) on the left side of Figure 2 of Murata et al. (JP 06-342858 A) prior to the crossing point at (8) (fields M1a and M1b), add to produce a downward magnetic field vector, designated by M1 between the wires.

Conversely, the contribution of the current I1 and I2 in the wires (1,2) on the right side of Figure 2 of Murata et al. (JP 06-342858 A) after the crossing at (8) (fields M2b and M2a), add to produce an upward magnetic field vector, designated by M2 between the wires.

Are these magnetic field vectors (M1 and M2) canceled equivalently at just any crossing point of the wires? Absolutely not. For example, if the length of the wires (1, 2) at the left-side of the crossing point (8) were longer relative to the length of the wires (1, 2) to the right of the crossing point in Figure 2 of Murata et al. (JP 06-342858 A) (that is, if Figure 2 of Murata et al. (JP 06-342858 A) were altered such that the crossing point at (8) actually occurred farther to the right-side of Figure 2), the magnetic fields vectors (M1, M2) would still indeed point in opposite directions, **but** the *magnetic field vector M1 would be greater in magnitude than the upward pointing vector M2,* since the contribution to the magnetic field M1 by the currents (I1 and I2) in the longer wires (1, 2) at the left-side of the crossing point (8) would yield a larger downward magnetic field magnitude (B) between the longer wires (1, 2) on the left side of the hypothetically moved crossing point, as shown by the Biot-Savart Law.

Additionally, in the above described hypothetical alteration of the depictions of Murata et al. (JP 06-342858 A), if the length of the wires (1, 2) at the right-side of the crossing point (8) were shorter relative to the length of the wires (1, 2) to the left of the crossing point in Figure 2 of Murata et al. (JP 06-342858 A), the *magnetic field vector M2 would be smaller in magnitude than the downward pointing vector M1,* since the contribution to the magnetic field M2 by the currents (I1 and I2) in the shorter wires (1, 2) at the right-side of the moved crossing point (8) would yield a smaller magnetic field magnitude (B) between the shortened wires (1, 2) on the right side of the hypothetically moved crossing point, as shown by the Biot-Savart Law.

Therefore, in this hypothetical alteration of the embodiments disclosed by Murata et al. (JP 06-342858 A) in which the crossing point is moved from the midpoint to, e.g., the right, while there would indeed be some cancelling of the vector strength of M1, there would still be an overall magnetic field vector M1 that points downward.

In Murata et al. (JP 06-342858 A), however, the "*magnetic fields are canceled equivalently*" as expressly stated and depicted in all embodiments of_Murata et al. (JP 06-342858 A)). See, e.g., paragraph [0010] of the enclosed STIC translation of Murata et al. (JP 06-342858 A). See also, page 7 at line 18, wherein it is also expressly stated that due to the crossing of wires (1, 2), "the overall magnetic field is canceled."

Clearly, it is no accident that each and every embodiment (Figure 6 is prior art) of Murata et al. (JP 06-342858 A) clearly and unquestionably depicts the crossing point of the wires (1, 2) as halfway between their respective endpoints.

Thus, given the express teachings and disclosures of Murata et al. (JP 06-342858 A) and Carpenter et al. (WO 98/20485 A1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a crossing point of said write lines between said preamplifier connection point and said slider contact pads of Carpenter et al. (WO 98/20485 A1) as placed halfway between said preamplifier connection point and said slider contact pads, as exemplified and taught by Murata et al. (JP 06-342858 A) - note also that Murata et al. (JP 06-342858 A) further suggest that more than one crossing is suitable, a la Carpenter et al. (WO 98/20485 A1). See paragraph [0016] of Murata et al. (JP 06-342858 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide a crossing point of said write lines between said preamplifier connection point and said slider contact pads of Carpenter et al. (WO 98/20485 A1) as placed halfway between said preamplifier connection point and said slider contact pads, as exemplified and taught by Murata et al. (JP 06-342858 A) - note also that Murata et al. (JP 06-342858 A) further suggest that more than one crossing is suitable, a la Carpenter et al. (WO 98/20485 A1) -see paragraph [0016] of Murata et al. (JP 06-342858 A)) in order to achieve the predictable result of providing a field which *is negated equivalently (i.e., symmetrically at a midway point of a single crossing),* whereby "the electromagnetic noise emission characteristics can be improved." See paragraph [0011] of Murata et al. (JP 06-342858 A).

Additionally, the following 35 USC 103(a) rejections are being made in light of a recent Supreme Court opinion.

The Supreme Court has issued its opinion in *KSR*, regarding the issue of obviousness under 35 U.S.C. 5 103(a) when the claim recites a combination of elements of the prior art. *KSR Int'l Co. v. Teleflex, Inc.*, 82 USPQ 2d 1385 (U.S. 2007).

In the decision, the Court reaffirmed the Graham factors in the determination of obviousness under 35 U.S.C. 5 103(a), inclusive of the four factual inquiries under Graham, which are:

(a) determining the scope and contents of the prior art;

(b) ascertaining the differences between the prior art and the claims in issue;

(c) resolving the level of ordinary skill in the pertinent art; and

(d) evaluating evidence of secondary consideration.

Graham v. John Deere, 383 U.S. 1, 17-18, 148 USPQ 459,467 (1966).

It is noted that the Court did not totally reject the use of "teaching, suggestion, or motivation" as a factor in the obviousness analysis. Rather, the Court recognized that a showing of "teaching, suggestion, or motivation" to combine the prior art to meet the claimed subject matter could provide a helpful insight in determining whether the claimed subject matter is obvious under 35 U.S.C. 103(a).

More noteworthy, however, the Court rejected a rigid application of the "teaching, suggestion, or motivation" (TSM) test, which required a showing of some teaching, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the prior art elements in the manner claimed in the application or patent before holding the claimed subject matter to be obvious.

The Court noted that the analysis supporting a rejection under 35 U.S.C. 103(a) should be made explicit, and that it was "important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. The Court specifically stated:

> Often, it will be necessary . . . to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an ***apparent reason*** to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis ***should be made explicit***.
> *KSR*, at 1396.

Moreover, the Supreme Court also held in *KSR*, that "t]he combination of familiar

elements according to known methods is likely to be obvious when it does no more than yield

predictable results." *Id.* at 1395.

(10) Response to Argument

Response to Arguments

The Appellant at page 8 bridging page 9 of the Brief filed on July 30, 2008, alleges that:

> the stated objective of Carpenter et al. is "providing reduced susceptibility
> to electromagnetic interference and stray signal pickup". Structurally,
> Carpenter solves its stated objective above by using, "a twisted wire
> transmission pair in order to provide self-shielding of one or multiple signal
> pairs against unwanted electromagnetic noise (EMI) or radio frequency
> interference (RFI). Therefore, the instant application and Carpenter use
> different structures to solve different problems. In summary, the instant
> application of protecting the trace assembly from interference from sources
> outside of the trace assembly. The title of Carpenter et al. contains the
> words "self-shielding". On the other hand, independent claim 1 of the
> instant application, which is listed below, clearly states the purpose of the
> instant application which is "used to cancel out time-delayed (transmission
> line effects) parts of said crosstalk and said EME".

Underling in original. The Examiner notes that the claims are being rejected, and not the

invention as disclosed within the Appellant's disclosure. Moreover, the Appellant has failed to

show where there is any structural difference between the claimed invention and what the

Examiner maintains that Carpenter et al. (WO 98/20485 A1) shows.

Simply put, Carpenter et al. (WO 98/20485 A1) is structurally identical to the *claimed*

invention, absent the crossing of the wires at a halfway point, which is taught and suggested by

Murata et al. (JP 06-342858 A). That the structure of Carpenter et al. (WO 98/20485 A1) also

has the additional benefit of self-shielding is not dispositive, when it meets the claimed structural

limitations. Moreover, the Appellant's position that the advantage of the invention is set forth in

the claims, and thus defines over Carpenter et al. (WO 98/20485 A1), only goes so far as to the

manner in which the structure of the claims define over the prior art. The Examiner can find no

precedent in which, where the structure of the claims is met by the prior art, the claims

nevertheless were allowed over the prior art based on the purported advantages provided in the

claims or the specification.

       The Appellant argues at page 10 of the Brief:

> Murata does not explicitly state that there is an exact mid-point crossing of
> write lines. Murata states that "a field negates mutually" in paragraph 0016.
> A person skilled in the art cannot necessarily infer that this phrase describes
> an exact mid-point of the write lines. Also, a person skilled in the art cannot
> necessarily infer that if "a field negates mutually" that it will totally cancel
> the noise produced. Second, the instant application provides proof of the
> unexpected beneficial result that the noise produced is indeed <u>completely</u>
> canceled out by the mid-point crossing of the write lines as indicated by the
> rigorous equation result on page 12 of the instant application.

       First the Examiner points out that nothing in the Appellant's claims or disclosure requires

a rigid and strict "*exact* mid-point crossing of write lines" as argued by the Appellant, merely a

crossing of lines at a halfway point.

       As set forth in the rejection, *supra*, as per claims 1 and 19, Carpenter et al. (WO

98/20485 A1) does not expressly disclose a single crossing point of said write lines between

said preamplifier connection point and said slider contact pads (22) as being placed halfway

between said preamplifier connection point and said slider contact pads - e.g., note the phrase "a

single crossing point" requires just a crossing at the midpoint, but does not preclude other

crosses of the wiring - e.g., see Appellant's claims 4 and 22, which depend from claims 1 and

19, respectively, and which recite "multiple crossing points."

  Murata et al. (JP 06-342858 A), however, discloses an integrated circuit chip, wherein

the signal lines (1, 2) between the IC chip (7) and the termination pads (3, 4) are crossed

halfway between the IC chip and the termination pads (3, 4). Murata et al. (JP 06-342858 A),

as readily depicted in FIG. 2, illustrates the advantages to such symmetrical midpoint crossing,

(i.e., a crossing at a half point between the lines (1, 2)), stating in paragraph [0010] of the

enclosed English translation (provided by the USPTO STIC Library and enclosed herewith):

> In the following, an explanation will be given regarding the operation in this
> application example with reference to Figure 2. As shown in the figure,
> currents I1, I2 flow in opposite directions on signal transmission lines (1),
> (2) crossing each other via glass film (8), respectively. On one side (left side
> in the figure) of the crossing portion between signal transmission lines (1),
> (2), magnetic field M1a generated by current I1 and magnetic field M1b
> generated by current I2 are in the direction where they strengthen each
> other, and synthetic magnetic field M1b is generated in the downward
> direction. On the other side (right side in this figure) of the crossing portion
> of signal transmission lines (1), (2), magnetic field M2a generated by
> current I1 and magnetic field M2b generated by current I2 are generated and
> they strengthen each other, so that synthetic magnetic field M2 is generated
> in the upward direction. That is, synthetic magnetic field M1 and synthetic
> magnetic field M2 are in directions that cancel each other. As a result, for
> the overall integrated circuit, ***the magnetic fields are canceled <u>equivalently</u>***,
> and the magnetic field emitted from the integrated circuit can be suppressed.
> Consequently, the electromagnetic noise emission characteristics can be
> improved. [Emphasis added].

  Note that the differential current signals (I1 and I2) correspond directly to the differential

current signals W- and W+ or R+ and R- of the disclosed Appellant's invention.

  Can these magnetic fields (M1 and M2) within Murata et al. (JP 06-342858 A) be

canceled equivalently (i.e., equal cancellation) at some arbitrary crossing point between the

wires? Certainly not. As is evidenced by Murata et al. (JP 06-342858 A) in each and every

instance of all the depicted embodiments, the crossing point is indeed halfway and symmetric in

order to balance out the opposing magnetic fields generated by each side of the crossing point.

More to the point, however, is the known Biot-Savart Law in physics, as it relates magnetic

fields to the currents which are their sources. See <u>Fundamentals of Physics</u> (Halliday and

Resnick, Copyright 1981 by John Wiley & Sons, Inc.) at pages 557-558, enclosed herewith.

        In scalar format, the Biot-Savart Law can be written as:

$$dB = \frac{\mu_0}{4\pi} \frac{I dl \sin \theta}{r^2} \Rightarrow B = \int \frac{\mu_0}{4\pi} \frac{I dl \sin \theta}{r^2}$$

Where I is the current,

dl is a the magnitude in the length of the differential element of the wire,

dB is the differential contribution to the magnetic field resulting from the differential element

of wire, and B is the summed magnetic field over the entire length of the wire,

μ_0 is the magnetic constant,

r is the distance from the wire element to the point at which the magnetic field is being

calculated.

        The point to be made here is that the strength of the magnetic field B associated with a

finite length of wire l, is directly proportional to the length of wire l. More to the point, for a

non-infinite or short length of wire carrying a current which generates a magnetic field, the

longer the wire, the stronger the magnetic field B contributed by that length of wire.

Turning now to Figure 2 of Murata et al. (JP 06-342858 A), the wires (1, 2), prior to crossing at (8) (i.e., the left side of the crossing point (8)), generate a composite or synthetic magnetic field downward (M1) due to the "Right-Hand" rule (right-hand thumb points in direction of current, fingers wrap-around the wire and represent the conventional magnetic field direction associated with such a directional current). Thus, the contribution of the current I1 and I2 in the wires (1,2) on the left side of Figure 2 of Murata et al. (JP 06-342858 A) prior to the crossing point at (8) (fields M1a and M1b), add to produce a downward magnetic field vector, designated by M1 between the wires.

Conversely, the contribution of the current I1 and I2 in the wires (1,2) on the right side of Figure 2 of Murata et al. (JP 06-342858 A) after the crossing at (8) (fields M2b and M2a), add to produce an upward magnetic field vector, designated by M2 between the wires.

Are these magnetic field vectors (M1 and M2) canceled equivalently at just any crossing point of the wires? Absolutely not. For example, if the length of the wires (1, 2) at the left-side of the crossing point (8) were longer relative to the length of the wires (1, 2) to the right of the crossing point in Figure 2 of Murata et al. (JP 06-342858 A) (that is, if Figure 2 of Murata et al. (JP 06-342858 A) were altered such that the crossing point at (8) actually occurred farther to the right-side of Figure 2), the magnetic fields vectors (M1, M2) would still indeed point in opposite directions, ***but** the *magnetic field vector M1 would be greater in magnitude than the upward pointing vector M2*, since the contribution to the magnetic field M1 by the currents (I1 and I2) in the longer wires (1, 2) at the left-side of the crossing point (8) would yield a larger downward magnetic field magnitude (B) between the longer wires (1, 2) on the left side of the hypothetically moved crossing point, as shown by the Biot-Savart Law.

Additionally, in the above described hypothetical alteration of the depictions of Murata et al. (JP 06-342858 A), if the length of the wires (1, 2) at the right-side of the crossing point (8) were shorter relative to the length of the wires (1, 2) to the left of the crossing point in Figure 2 of Murata et al. (JP 06-342858 A), the *magnetic field vector M2 would be smaller in magnitude than the downward pointing vector M1*, since the contribution to the magnetic field M2 by the currents (I1 and I2) in the shorter wires (1, 2) at the right-side of the moved crossing point (8) would yield a smaller magnetic field magnitude (B) between the shortened wires (1, 2) on the right side of the hypothetically moved crossing point, as shown by the Biot-Savart Law.

Therefore, in this hypothetical alteration of the embodiments disclosed by Murata et al. (JP 06-342858 A) in which the crossing point is moved from the midpoint to, e.g., the right, while there would indeed be some cancelling of the vector strength of M1, there would still be an overall magnetic field vector M1 that points downward.

In Murata et al. (JP 06-342858 A), however, the "***magnetic fields are canceled equivalently***" as expressly stated and depicted in all embodiments of Murata et al. (JP 06-342858 A)). See, e.g., paragraph [0010] of the enclosed STIC translation of Murata et al. (JP 06-342858 A). See also, page 7 at line 18, wherein it is also expressly stated that due to the crossing of wires (1, 2), "the overall magnetic field is canceled."

Clearly, it is no accident that each and every embodiment (Figure 6 is prior art) of Murata et al. (JP 06-342858 A) clearly and unquestionably depicts the crossing point of the wires (1, 2) as halfway between their respective endpoints.

Thus, given the express teachings and disclosures of Murata et al. (JP 06-342858 A) and Carpenter et al. (WO 98/20485 A1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a crossing point of said write lines between said preamplifier connection point and said slider contact pads of Carpenter et al. (WO 98/20485 A1) as placed halfway between said preamplifier connection point and said slider contact pads, as exemplified and taught by Murata et al. (JP 06-342858 A) - note also that Murata et al. (JP 06-342858 A) further suggest that more than one crossing is suitable, a la Carpenter et al. (WO 98/20485 A1). See paragraph [0016] of Murata et al. (JP 06-342858 A).

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide a crossing point of said write lines between said preamplifier connection point and said slider contact pads of Carpenter et al. (WO 98/20485 A1) as placed halfway between said preamplifier connection point and said slider contact pads, as exemplified and taught by Murata et al. (JP 06-342858 A) - note also that Murata et al. (JP 06-342858 A) further suggest that more than one crossing is suitable, a la Carpenter et al. (WO 98/20485 A1) -see paragraph [0016] of Murata et al. (JP 06-342858 A)) in order to achieve the predictable result of providing a field which *is negated equivalently (i.e., symmetrically at a midway point of a single crossing),* whereby "the electromagnetic noise emission characteristics can be improved." See paragraph [0011] of Murata et al. (JP 06-342858 A).

The Appellant at page 10 of the Brief alleges:

> Murata et al. is in different fields of practice than the instant application and Carpenter. Murata is in the field of hybrid integrated circuits, whereas the instant application and Carpenter are in the field of magnetic recording assemblies. Murata et al. refers to magnetic fields not induced crosstalk

voltage caused by capacitive coupling as in the instant application. For example, this is clearly demonstrated in Murata's Purpose, "To obtain a hybrid integrated circuit enabling suppression of a magnetic field generated when a differential signal is transmitted and also improvement of a <u>noise</u> emission characteristic." The above shows that Murata is in a different field from both the instant application and in a different field from Carpenter. Therefore, as the Supreme Court has stated, it is "important to identify a <u>reason</u> that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements" in the manner claimed. Since Murata is in the field of hybrid integrated circuits and not magnetic trace assemblies such as in the instant application and as in Carpenter, there is not a clear reason that would have prompted a person of ordinary skill in the relevant field to combine Murata with Carpenter. It can be argued that Murata is <u>not pertinent</u> to the instant application, since one ordinarily skilled in the art would not logically be expected to combine the trace assembly aspects of Carpenter with the integrated circuit designs of Murata. This is especially true, since the language of Murata does not explicitly state that the noise is totally suppressed. Therefore independent claims 1 and 19 should be allowed since there is no obvious reason to combined Carpenter with Murata. Similarly, dependent claims 3-6 and 21-24 which depend on independent claims 1 and 19 should now be allowed.

Underlining is in original.

It appears that the Appellant contends that Murata et al. (JP 06-342858 A) is in "different fields of practice than the instant application and Carpenter." However, it is well settled that the prior art relevant to an obviousness determination encompasses not only the field of the inventor's endeavor, but also any analogous arts. See *Heidelberger Druckmaschinen AG v. Hantscho Commercial Products Inc.*, 21 F.3d 1068, 30 USPQ2d 1377 (Fed. Cir. 1994) and *In re Wood*, 599 F.2d 1032, 202 USPQ 171 (CCPA 1979). The test of whether a reference is from a nonanalogous art is first, whether it is within the field of the inventor's endeavor, and second, if it is not, whether it is reasonably pertinent to the particular problem with which the inventor was involved. See *In re Wood*, 599 F.2d at 1036, 202 USPQ at 174 (CCPA 1979). A reference is

reasonably pertinent if, even though it may be in a different field of endeavor, it is one which because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem. *In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1061 (Fed. Cir. 1992).

Here, the Appellant's and Carpenter et al. disclosures are concerned with suppression of extraneous signals along signal transmission interconnections that could interfere with electromagnetic sources that interact, disadvantageously, with signal lines between components in a signal integrated circuit structure.

Murata et al. discloses an analogous integrated circuit structure, using an IC chip. As is known, a hybrid integrated circuit generally has on an appropriate support several passive components, such as resistors and capacitors deposited as thin or thick films, and several active components, such as diodes, transistors, or monolithic integrated circuits. The components are interconnected by an interconnection network consisting of conducting layers, for transmitting signals.

Moreover, Murata et al. (JP 06-342858 A) discloses such an integrated circuit chip, wherein the signal lines (1, 2) between the IC chip (7) and the termination pads (3, 4) are crossed halfway between the IC chip and the termination pads (3,4).

Murata et al. (JP 06-342858 A), as readily depicted in FIG. 2, illustrates the advantages to such midpoint crossing, stating in paragraph [0010]:

> In the following, an explanation will be given regarding the operation in this application example with reference to Figure 2. As shown in the figure, currents I1, I2 flow in opposite directions on signal transmission lines (1), (2) crossing each other via glass film (8), respectively. On one side (left side in the figure) of the crossing portion between signal transmission lines (1), (2), magnetic field M1a generated by current I1 and magnetic field M1b

generated by current I2 are in the direction where they strengthen each other, and synthetic magnetic field M1b is generated in the downward direction. On the other side (right side in this figure) of the crossing portion of signal transmission lines (1), (2), magnetic field M2a generated by current I1 and magnetic field M2b generated by current I2 are generated and they strengthen each other, so that synthetic magnetic field M2 is generated in the upward direction. That is, synthetic magnetic field M1 and synthetic magnetic field M2 are in directions that cancel each other. As a result, for the overall integrated circuit, *the magnetic fields are canceled equivalently*, and the magnetic field emitted from the integrated circuit can be suppressed. Consequently, the electromagnetic noise emission characteristics can be improved. [Emphasis added].

Given the express teachings and disclosures of Murata et al. (JP 06-342858 A) and Carpenter et al. (WO 98/20485 A1), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a crossing point of said write lines between said preamplifier connection point and said slider contact pads of Carpenter et al. (WO 98/20485 A1) as placed halfway between said preamplifier connection point and said slider contact pads, as exemplified and taught by Murata et al. (JP 06-342858 A) - note also that Murata et al. (JP 06-342858 A) further suggest that more than one crossing is suitable, ala Carpenter et al. (WO 98/20485 A1). See paragraph [0016] of Murata et al. (JP 06-342858 A) in order to achieve the predictable result of providing a field which *is negated equivalently (i.e., symmetrically at a midway point of a single crossing),* whereby "the electromagnetic noise emission characteristics can be improved." See paragraph [0011] of Murata et al. (JP 06-342858 A).

In the Examiner's view, Murata's et al. (JP 06-342858 A) field of endeavor (i.e., an electrical interconnection between and among integrated circuitry) logically would have commended itself to an inventor's attention in considering the problem of minimizing or suppressing noise on the electrical trace interconnections between IC's and associated electrical

components. Thus, while Murata et al. (JP 06-342858 A) may not be in the Appellant's field of endeavor, he is nevertheless reasonably pertinent to the problem with which the Appellant was faced. This being the case, the second prong of the test set forth in *Wood* is satisfied and therefore Murata et al. (JP 06-342858 A) is analogous art. See also a recent decision, *In re Icon Health and Fitness, Inc.* 496 F.3d 1374, 83 USPQ 2d 1746 (Fed. Cir. 2007) wherein the Court maintained the combination of a Murphy bed and an exercising treadmill was proper. Moreover, "[f]amiliar items may have obvious uses beyond their primary purposes." *KSR*, 127 S. Ct. at 1742, 82 USPQ 2d at 1390.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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